REMARKS

By this Amendment, Applicants canceled claim 2 without prejudice or disclaimer and added new claims 14-21. Therefore, claims 1, 3, 4, and 11-21 are currently pending. In the Office Action, the Examiner rejected claims 1-4 and 11-13 under 35 U.S.C. § 103(a) as unpatentable over Ye et al. (U.S. Patent No. 6,080,529) in view of Lau et al. (U.S. Patent No. 5,173,542). To establish a prima facie case of obviousness under 35 U.S.C. § 103(a), each of three requirements must be demonstrated. First, Ye in view of Lau, when combined, must disclose or suggest each and every element recited in the claims. See M.P.E.P. § 2143, page 2100-122. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. See id. Third, a reasonable probability of success must exist. See id. Applicants respectfully traverse the rejection for at least the following reasons.

Each of claims 1 and 11 recites, among others, patterning a low-dielectric layer using a photoresist pattern as a mask, removing the photoresist pattern, and shrinking the low-dielectric pattern. As the Examiner admitted, Ye does not disclose at least shrinking a low-dielectric pattern. See Office Action, page 3. The Examiner alleged that Lau "describes the standard procedure of the shrinking the low-dielectric pattern by curing the low-dielectric pattern . . . to cross link the polymers." Office Action, pages 3-4. The Examiner also alleged that "Lau teaches curing at 300-450 degrees centigrade of [low dielectric] materials for the same purpose (cross linking) therefore what is true

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

for the applicants' (naturally occurring phenomenon i.e. shrinkage during curing process) is also true for the Lau reference." Office Action, page 7. Applicants diagree.

Applicants submit that Lau does not teach or suggest shrinking a low dielectric pattern because cross linking is not necessarily the same as shrinking. Not every low dielectric material shrinks when cured for cross linking. For example, SiLK™ H, which is a low dielectric material and a product by the Dow Chemical Company, does not shrink when cured for cross linking. [1] If the Examiner continues to maintain that cross linking is the same as shrinking, Applicants respectfully request the Examiner to particularly point out on what basis the Examiner has reached that conclusion in a non-final office action so that Applicants may have the opportunity to reply completely. Therefore, Ye and Lau, even if they were combined, fail to disclose or suggest all features of claims 1 and 11.

Furthermore, claim 1 recites removing a photoresist pattern and shrinking a low-dielectric pattern, wherein removing the photoresist pattern and shrinking the low-dielectric pattern are performed at the same time. Neither Ye nor Lau teaches or suggests removing a photoresist pattern and shrinking a low-dielectric pattern at the same time, as recited in claim 1.

Further, Ye and Lau cannot be combined because there is no suggestion or motivation, either in Ye and Lau themselves or in the knowledge generally available to one of ordinary skill in the art, to combine Ye and Lau in a manner resulting in the invention recited in claims 1 or 11. The Examiner alleges that both Ye and Lau are

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

1 Applicants note that, when cured for cross-linking, SiLK-H exhibits a shrinkage of less than 0.1%, in which case one skilled in the art would consider that SiLK-H does not shrink.

"patent[s] from the same field of endeavor (both Ye and Lau deal low dielectric layers made from organic polymers including PTFE, etc.). Office Action, page 3. However, the nature of the problem to be solved in the claimed invention is forming fine patterns of a semiconductor device by shrinking a low dielectric pattern, and neither Ye nor Lau is directed to forming fine patterns of a semiconductor device. Ye is directed to "a method of patterning a semiconductor device conductive feature while permitting easy removal of any residual masking layer" and is also directed to "a specialized etch chemistry useful in the patterning of organic polymeric layers." Abstract. Lau is directed to "bistriazene compounds useful for cross linking polymers." Abstract. Applicants also submit that there was no reasonable expectation of success to modify Ye and Lau in a manner resulting in the invention recited in claim 1 or 11 because there is no evidence, either in Ye and Lau themselves or in the knowledge generally available to one of ordinary skill in the art, suggesting the modification would be successful.

Therefore, Applicants submit that claims 1 and 11 are patentable and that the rejection of claims 1 and 11 under 35 U.S.C. § 103(a) be withdrawn. Claims 3, 4, and 12-21 depend on claim 1 or 11. For at least the reasons given above with respect to claims 1 and 11, Applicants respectfully request that the rejection of claims 3, 4, and 11-21 under 35 U.S.C. § 103(a) be withdrawn and the claims be allowed.

Furthermore, claims 16-17 and 20-21 each recite patterning a low-dielectric layer formed of an inorganic spin-on-glass layer and shrinking the low dielectric pattern. Ye and Lau, either singly or in combination, fail to teach or suggest patterning a low-dielectric layer formed of an inorganic spin-on-glass layer and shrinking the low dielectric pattern.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

CONCLUSION

In view of the foregoing remarks, Applicants respectfully submit that claims 1, 3, 4, and 11-21 define patentable subject matter, and that the application is in condition for allowance. Applicants respectfully request the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: December 11, 2003

By: _____
Qingyu Yin*

*With limited recognition under 37 C.F.R. §10.9(b).

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

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